

DESCRIPTIONS OF SOME TERTIARY SHELLS FROM NEW ZEALAND.

By HENRY SUTER.

Read 9th November, 1906.

PLATE XVIII.

A FEW years back a number of fossil shells were kindly given me for description by Professor James Park, F.G.S., Director of the School of Mines, Dunedin, and the following is the result of my investigations, most kindly assisted by Dr. W. H. Dall, of Washington.

LAPPARIA PARKI, n.sp. Pl. XVIII, Figs. 1, 2.

Shell fusiform, with large caricelloid protoconch, costate lower whorls, and 5 oblique plaits on the pillar. Sculpture: one of the specimens shows distinct marks of spiral striation on the last whorl of the protoconch, but on the succeeding whorls hardly a trace of it is visible. The axial sculpture consists of sharp, slightly flexuous ribs, 14 on the fifth whorl, extending over the whole height of the whorls; interstices with numerous, close, feebly marked incremental lines. Spire conical, a little shorter than the aperture. Protoconch consisting of $2\frac{1}{2}$ to 3 whorls with impressed suture, the apex lateral, raised, and pointed; the first two whorls convex, slightly higher than the last whorl, which is also less rounded. Whorls slightly straightened below the suture, thence flatly convex. Suture superficial, undulated by the axial costation. Aperture long and narrow, margins subparallel. Columella nearly straight, slightly concave at the base, with 5 sub-equidistant oblique and slender plaits. Inner lip spreading as a very thin callus over the pillar and on to part of the body. Height 23, breadth 7.5 mm. (immature shell).

Locality.—Lower Gorge of Pareora River, Canterbury, New Zealand (Professor J. Park).

Formation.—Labelled "Oamaru Series, Oligocene." However, since I received the specimens Professor Park has published a paper on the "Marine Tertiaries of Otago and Canterbury," in which he estimates the Oamaru Series as belonging to the Miocene.¹

Type in my collection. All the fossils under consideration I sent to Dr. W. H. Dall for examination, and he expressed the opinion that these New Zealand fossils recall the North American Eocene more than the Oligocene. On this particular species Dr. Dall kindly wrote to me: "I am much interested in your specimen, which, as you say, recalls the *Caricella* type of nucleus strikingly. It is, however, in some respects intermediate between the typical *Caricella* and the shell named by Conrad *Lapparia*, which is closely allied to *Caricella*. Both, without a doubt, belong to the group with a membranous protoconch. I am glad to see it, since it shows the course of

¹ Trans. N. Zeal. Inst., vol. xxxvii (1905), pp. 503, 550.

evolution was analogous in both hemispheres, while Mr. M. Cossmann (speaking, I am sure, on insufficient evidence) has claimed that this was not the case. The fossil is quite immature, but I incline to the belief that the adult would show a form not very far removed from *Psephæa concinna*, Brod."

The species differs from the typical *Lapparia*, and partly also from *Caricella*, by the almost complete absence of spiral sculpture and the presence of five columellar plaits, and it therefore becomes questionable whether it should not form a new subgenus or section of one of the two genera. I have classed it under *Lapparia* because I think it shows more affinities with that genus than with *Caricella*. Both genera are recorded from the Eocene and not from newer formations, and it therefore is open to question whether or not part of the Oamaru Series should be relegated to the Oligocene period.

An interesting fact was pointed out by the late Captain F. W. Hutton in his "Index Faunæ Novæ-Zelandiæ" (p. 17): Several genera of marine mollusca appear in the Eocene of Australia, but did not reach New Zealand until the Miocene and Pliocene periods. I am not sufficiently well acquainted with the Australian Eocene Volutidæ to say whether forms are known which might be considered the ancestors of our species.

The species is named in honour of Professor James Park, our distinguished geologist.

PLEUROTOMA PAREORAENSIS, n.sp. Pl. XVIII, Fig. 3.

Shell fusiform, thin and fragile, height of aperture less than that of the spire, upper whorls nodulous, body-whorl finely spirally grooved. The sculpture consists of small oblique nodules on the upper three whorls below the nucleus, but faintly indicated on the following volutions. On the fourth and following whorls shallow, close, spiral grooves adorn the lower half; on the body-whorl a fine spiral groove below the suture is present, and from below the sinus-area subequidistant, somewhat deeper, spiral grooves occur down to the base. Spire high, turreted. Protoconch lost. Whorls about 8 to 9, flatly shouldered, convex below the periphery, body-whorl convex, contracted towards the base. Suture distinct, but shallow. Aperture oblong, shorter than the spire, produced into a prominent, slightly flexuous canal, truncated at the base. Outer lip rather sharp and thin. Columella slightly sinuous and covered by a thin and narrow callus. Sinus distinctly marked by growth periods, broadly rounded, not deep, situate between the suture and periphery. Height about 20-22, breadth 6 mm.

Locality.—White Rock, Pareora River, Canterbury, New Zealand (Professor J. Park).

Formation.—Labelled "Oamaru Series, Oligocene." Miocene (Professor J. Park, 1905).

Type in my collection. In outline and sculpture this species stands nearest to *Drillia Buchanani*, Hutton, which, however, is a more solid shell, much more distinctly shouldered, and with the axial costæ persisting on all the whorls.

EXILIA DALLI, n.sp. Pl. XVIII, Figs. 4, 5.

Shell slender, fusiform, longitudinally costate and spirally striate, with a narrow aperture and long, straight canal. The sculpture consists of longitudinal, close, oblique, and slightly flexuous ribs, about 20 on the penultimate whorl; they are rounded and of the same width as the interstices. Spiral sculpture formed by close-set narrow grooves, extending over the ribs, and absent over a short space below the suture from the eighth whorl downwards. Spire subulate, higher than the aperture. Protoconch small, formed by two smooth, shining, and rounded whorls. Whorls 10 on the immature specimen before me, flatly convex, regularly increasing in size, the body-whorl very little expanded, prolonged into a straight and long canal. The lower part of this is broken off. Suture impressed, distinct. Aperture narrow, pyriform. Outer lip, which is broken off, no doubt slightly flexuous. Columella with a slight elevation in the middle, two inconspicuous and slender plaits juts below the suture, which may easily be overlooked. The inner lip spreading as a thin narrow glaze over the pillar. Height about 20, breadth 5 mm.

Locality.—White Rock, Parcora River, Canterbury, New Zealand (Professor J. Park).

Formation.—Labelled "Oamaru Series, Oligocene." Miocene (J. Park, 1905).

Type in my collection. Dr. W. H. Dall's comment on this species is: "Immature shell, related to, if not identical with, my *Plicifusus*. We have a recent species, *P. rectirostris*, Carpenter, very much like this, though larger; we have in our Eocene a number of species very similar to your fossil, and for them Conrad proposed the genus *Exilia* (which does not have plaits on the pillar, as stated by Cossmann). It is quite possible that the name should be retained, as there are some characters which seem to divide the Eocene and Oligocene forms from our similar, but always larger and coarser, *Plicifusus* of the recent fauna."

As stated in the diagnosis, my specimen has two columellar plaits. However, I must confess that I might not have seen them if I had not especially looked for them in consequence of Cossmann's statement.¹

I have much pleasure in uniting Dr. W. H. Dall's name with the species as a mark of my deep-felt gratitude for the very liberal and always most valuable help he has accorded me in my conchological studies. Those who have access to large collections and extensive libraries have no idea what such kind help means to a worker in New Zealand, where a scientist has not these facilities.

CARDIUM (*TRACHYCARDIUM*) *WAITAKIENSE*, n.sp. Pl. XVIII, Fig. 6.

There being only the central part of a right valve in my possession, the description must, for the present, remain fragmentary.

Shell solid, ventricose, radiately very finely ribbed; the ribs number

¹ Essais de Paléocochologie Comparée, livr. iv (1901), p. 26.

about 60, they are flat, smooth, the sulci slightly narrower than the ribs. A few concentric low ridges are visible on the posterior part of the shell, forming low nodules on crossing the ribs. This seems to imply that towards the margin the ribs may have been granulate, squamose, or spinous. Umbo elevated, incurved, and slightly prosogyrate. The hinge-plate is rounded, elevated, and bent over towards the rather long and straight nympha, forming a deep groove for the insertion of the ligament. There are two smooth cardinals reaching as high as the top of the umbo; the posterior tooth is stouter, conical, united on the outside with the smaller anterior tooth, leaving a deep socket between them. Part of a posterior lateral tooth is present.

The anterior part of the shell is most likely much shorter than the posterior, and the length of the valve may have been between 40 and 50 mm.

Locality.—Waitaki Valley, North Otago, New Zealand (Professor J. Park).

Formation.—Warekuri Greensands. Labelled "Oamaru Series, Oligocene." Miocene (J. Park, 1905).

Type in my collection. Dr. W. H. Dall wrote about this species: "A *Cardium*, belonging to the section *Trachycardium*, and related to *C. gigas*, DeFr., of the Paris basin Eocene."

Professor Park also sent me a fragment of a carditoid shell, near *Venericardia*, which, however, is quite insufficient for description.